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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,966	11/18/2003	Cyril Cabral JR.	YOR920030287US1 (20140-00	4605

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EXAMINER	
VU, HUNG K	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/714,966	CABRAL ET AL.	
	Examiner	Art Unit	
	Hung Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-10,32-34,36-39,41 and 45* is/are pending in the application.

4a) Of the above claim(s) *7,36 and 37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6,8-10,32-34,38,39,41 and 45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 7, 36 and 37, which are not belong to the elected embodiment, are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 03/29/05.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5, 6, 8-10, 32, 38, 39, 41 and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Inoue et al. (US 2003/0075808, of record).

Inoue et al. discloses, as shown in Figures 1A – 2C, a composite material comprising:

a layer containing copper (7);

a CoWP film (20) on the copper layer, wherein the CoWP film contains from 13.2 atom percent to 25 atom percent phosphorus and has a thickness from 5 nm to 200 nm. Note [0215] and [0222].

The term "electrodeposited" is method recitation in a device claimed. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 5, Inoue et al. discloses the copper layer is disposed between the CoWP film and a metal layer (6).

Regarding claim 6, Inoue et al. discloses the copper layer and the metal layer is disposed within a trench or via of a dielectric material.

Regarding claims 8, 9 and 38, Inoue et al. discloses the CoWP film has a thickness from 10 nm to 50 nm (with the range of 5 nm to 50 nm or 10 nm to 30 nm).

Regarding claim 32, Inoue et al. discloses, as shown in Figures 1A – 2C and 33, an interconnect structure comprising:

a trench or a via disposed within a dielectric material (2, 122, 134), wherein the trench or via is filled with a metal layer (6, 126, 136) disposed along the sidewalls of the trench or the via, and a conducting layer (7) containing copper;

an amorphous CoWP film (20 ,130, 142) on the copper layer, wherein the CoWP film contains from 13.2 atom percent to 25 atom percent phosphorus and has a thickness from 5 nm to 200 nm. Note [0215] and [0222].

The term "electrodeposited" is method recitation in a device claimed. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 41 and 45, Inoue et al. discloses the CoWP film contains from 16.5 atom percent phosphorus to 25 atom percent phosphours.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 3, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US 20030075808, of record) in view of Lopatin et al. (PN 6,528,409, of record). Regarding claims 2 and 33, Inoue et al. discloses the claimed invention including the composite material as explained in the rejection above. Inoue et al. does not disclose the CoWP film

contains from 3 atom percent to 10 atom percent tungsten. However, Lopatin et al. discloses a composite material comprises a CoWP film contains from 2 atom percent to 4 atom percent tungsten (within the range of 3 atom percent to 10 atomic percent). Note Col. 10, lines 45-59. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the CoWP film of Inoue et al. containing from 3 atom percent to 10 atom percent tungsten, such as taught by Lopatin et al. in order to have the desired hardness.

Regarding claims 3 and 34, Inoue et al. and Lopatin et al disclose the claimed invention including the composite material as explained in the rejection above. Inoue et al. and Lopatin et al. do not disclose the CoWP film consists essentially of $Co_xW_yP_z$, wherein $0.75<x<0.85$ and $x+y+z = 1$. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the composition of the CoWP to have a desired at %, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

4. Applicant's arguments filed 07/10/06 have been fully considered but they are not persuasive.

It is argued, at page 2 of the Remarks, that claims 3, 36 and 37 depend from allowed "generic claims, applicant is entitled to consideration of these claims to additional species which are written in dependent form pursuant to 37 CFR 1.141. This argument is not convincing because there being no allowable generic or linking claim.

It is argued, at pages 2-3 of the Remarks, that the atomic percentage range given is the at % range for the concentration of the alloying solution, not the resulting CoWP film. This argument is not convincing because it is inherent that the at % in the solution will be the same as that in the CoWP film. The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997) ("An assertion of what seems to follow from common experience is just attorney argument and not the kind of actual evidence that is required to rebut a prima facie case of obviousness."). See MPEP 716.01(c) for examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday to Friday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272 - 1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vu

September 14, 2006

Hung Vu

Primary Examiner